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any more than foreshortened angels? They say that arm is too short.

So much is stirring around; but more is stirring within. The crowd rub past, and move on, upsetting his *crayons* or his *bread*, looking at his work, not at him; he sees himself, however; he sees, moreover, ten years in advance, the same hurry, the same crowd, the same critics, and his bread, perhaps sliding away from him. It is his first "exhibition" and his first "critique." Next day is private and silent. Walk into another chamber, an echo gets up to reprove you—the hollow cough of Time, whose sleep your footsteps have broken! For the long Roman gallery, with round, dusky skylights, has emperors in permanent gloom, silent two thousand years; silent senators and sages; eagles, mistresses, and winecupps silent. And Egypt is silent on these days. The obelisk shadows Anubis; Anubis shadows the sphinx; the sphinx, an open sarcophagus. The student sees their monstrous perspective, but does not go there; and the Elgin Room is silent; the silence of pale light floats over the marble, the seated grandeurs, and the columns. The shadow is washed off, and the form, no longer solid, becomes ghostly: the marble looks out through the shadow. I sat by a white-robed Ionian, a summer's day, her luminous hands a little warm, her hair sunk on to her shoulder. I saw her going up the rock of the city. I followed her with the maidens to the Temple; I saw them in the steady sun; my hands would not work, for my purpose was changed; to sit looking at this white-robed Ionian, till my heart getting far into Greece, I said: "Lodestar, Pasithoe, lodestar of Athens, your soul, and your eyes are deep. The young men of Athens seek you, Pasithoe; your eyes, not the proud neck and wilful shoulder. What though your fingers broidered the Peplos, the young men are riding on unconquerable horses, the sages and poets walk, tempering the harp to the rhythm of entangled verse: do you listen to the harp and the wrangle of the reins, with eyes in the dust, Pasithoe?" So I idled with the marble Grecian, and went away at sunset. The streets rolled out a strange black humanity with black truncated shafts upon their heads. The city, a transitory lifted scurf, with a blistered tumescence for a dome, and many-forked fungi for spires, was all to be swept down by wholesome winds, that the ancient vegetation might return; for this having been a day of dreams and wanderings in old lands, up and down two-and-twenty centuries, our race here, with all its fragile appearances of houses, seemed just a speck in time, or casual exposition of the earth, not to be numbered in the tale of years.

Twice a week the student gets this remote view of "humanity;" thrice he is rubbed hard against it, and as worldly, with the people all about him, as the best man of business in the city is. Thrice a week, then, I studied my position in the world; twice I was out of it altogether. Still, this is strictly my *own* experience, since profane ones there were, even on students' days, who rolled halfpence from one end of the Elgin Room to the other, poised them on their hands, and shuffled along seats, pelled missiles both of bread and clay, and "leap-frogged" the owl of Minerva. The advertisement, "*Athletic uprights* going

to commence," or "here goes over the owl," would sometimes dispel my *Hellenics*. These were exceptional cases, however, mainly confined to lunch-time. The Townley Gallery, where I now worked, though not so profuse or literally rolling in coin as the Elgin Room, partly from want of space, and partly from certain officials in its vicinity, was nevertheless most liberal in its "distribution of bread," wherever an unostentatious corner could be found for the act of benevolence. Neither age nor sex was spared; and young ladies, in love with Antinous, might be seen, with distressed eyebrows, extricating such missiles from their curls. My model was literally studded with them, and nothing, I believe, but the threat to retaliate with *clay*, enabled me to finish it, which I did shortly after. It was finished at the end of June, 1840. Brucciani cast it successfully, and early in July, accompanied by the required "testimony to moral character from some respectable person," it was deposited in the care of G. Jones, Esq., R.A., Keeper of the Royal Academy. J. T.

GROTESQUE RENAISSANCE.

(From *Stones of Venice*.)

"It is not, however, in every symbolical subject that the fearful grotesque becomes embodied to the full. The element of distortion which affects the intellect when dealing with subjects above its proper capacity, is nothing compared with that which it sustains from the direct impressions of terror. It is the trembling of the human soul in the presence of death which most of all disturbs the images on the intellectual mirror, and invests them with the fitfulness and ghastliness of dreams. And from the contemplation of death, and of the pangs which follow his footsteps, arise in men's hearts the troop of strange and irresistible superstitions which, more or less melancholy or majestic according to the dignity of the mind they impress, are yet never without a certain grotesqueness, following on the paralysis of the reason and over-excitement of the fancy. I do not mean to deny the actual existence of spiritual manifestations; I have never weighed the evidence on the subject; but with these, if such exist, we are not here concerned. The grotesque which we are examining arises out of that condition of mind which appears to follow naturally upon the contemplation of death, and in which the fancy is brought into morbid action by terror, accompanied by the belief in spiritual presence, and in the possibility of spiritual apparition. Hence are developed its most sublime, because its least voluntary creations, aided by the fearfulness of the phenomena of Nature which are in any wise the ministers of death, and primarily directed by the peculiar ghastliness of expression in the skeleton, itself a species of terrible grotesque in its relation to the perfect human frame.

Thus, first born from the dusty and dreadful whiteness of the charnel-house, but softened in their forms by the holiest of human affections, went forth the troop of wild and wonderful images, seen through tears, that had the mastery over our Northern hearts for so many ages. The powers of sudden destruction lurking in the woods and waters, in the rocks and clouds; kelpie

and gnome, Lurlei and Hartz spirits; the wrath and foreboding phantom; the spectra of second sight; the various conceptions of avenging or tormented ghosts, haunting the perpetrator of crime, or expiating its commission; and the half fictitious and contemplative, half visionary and believed images of the presence of death itself, doing its daily work in the chambers of sickness and sin, and waiting for its hour, in the fortalices of strength and the high places of pleasure; these, partly degrading us, by the instinctive and paralyzing terror with which they are attended, and partly ennobling us, by leading our thoughts to dwell in the external world, fill the last and the most important circle in that great kingdom of dark and distorted power, of which we all must be, in some sort, the subjects, until mortality shall be swallowed up of life; until the waters of the last fordless river cease to roll their untransmutable volume between us and the light of heaven, and neither death stand between us and our brethren, nor symbols between us and our God.

Extracts from the "Conclusion."

There is not at this moment a junior student in our schools of painting who does not know fifty times as much about the Art as Giotto did; but he is not for that reason greater than Giotto; no, nor his work better, nor fitter for our beholding. Let him go on to know all that the human intellect can discover and contain in the term of a long life, and he will not be one inch, one line, nearer to Giotto's feet. But let him leave his academy benches, and innocently, as one knowing nothing, go out into the highways and hedges, and there rejoice with them that rejoice, and weep with them that weep; and in the next world, among the companies of the great and good, Giotto will give his hand to him, and lead him into their white circles, and say, "This is our brother."

We have just seen that all great art is the work of the whole living creature, body and soul, and chiefly of the soul. But it is not only the *work* of the whole creature; it likewise *addresses* the whole creature. That in which the perfect being speaks, must also have the perfect being to listen. I am not to spend my utmost spirit, and give all my strength and life to my work, while you, spectator or hearer, will give me only the attention of half your soul. You must be all mine, as I am all yours; it is the only condition on which we can meet each other. All your faculties, all that is in you of greatest and best, must be awake in you, or I have no reward. The painter is not to cast the entire treasure of his human nature into his labor, merely to please a part of the beholder; not merely to delight his senses, not merely to amuse his fancy, not merely to beguile him into emotion, not merely to lead him into thought; but to do *all* this. Senses, fancy, feeling, reason, the whole of the beholding spirit, must be stilled in attention or stirred with delight; else the laboring spirit has not done its work well. For observe, it is not merely its *right* to be thus met, face to face, heart to heart; but it is its *duty* to evoke this answering of the other soul: its trumpet-call must be so clear that, though the challenge may, by



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higher walks of painting, there was employment no more; and the shadows of Rembrandt, and the savageness of Salvator, arrested the admiration which was no longer permitted to be rendered to the gloom or the grotesqueness of the Gothic aisle. And thus the English school of landscape, culminating in Turner, is in reality nothing less than a healthy effort to fill the void which the destruction of Gothic architecture has left.

SECRETS OF THE GEMS.

THAT many things glitter which are not gold, is well known; but do the wearers of jewelry know that the bright and beautiful colors exhibited by most of their much prized gems are purely artificial? Nature supplies the raw material, and art steps in to embellish it. The brilliant necklace or bracelet, which, with the native hue of the stone, would by no means be considered ornamental, becomes matchless in tint and lustre after passing through the hands of the artificer. Your chemist, always discovering something, and always ready with marvellous transformations, is truly a remarkable personage. He is jealous of his secrets, but not always able to keep them. If he could set a seal on his doings, our readers would not have been entertained with the present article, in which we shall take leave to reveal some of his processes.

Let us begin with agate—rather a common stone, found almost everywhere, and in numerous varieties, among which are the chalcedony, cornelian, onyx, sardonyx, and heliotrope. They all consist principally of quartz, and are more or less pellucid. In some places they are surprisingly abundant. One of these places is Oberstein, some thirty or forty miles up the valley of the Nahe, a region not often visited by summer tourists, yet interesting enough to repay him who shall explore its devious by-ways and paths along the river. At the village just mentioned, and at Idal, four miles distant, formations of coarse red conglomerate are met with, interposed with trap and greenstone; and in a soft stratum in these rocks, agates are found in considerable quantities. The workings may indeed be called agate-quarries, for they are carried on in the precipitous side of a hill; and to him who sees them for the first time, there is something remarkable in the species of industry created by the presence of the stones.

The nodules of agate, as they come from their long-undisturbed bed, are generally of an ashen-gray color. The first operation in the process of transformation is to wash them perfectly clean; then to put them into a vessel containing a mixture of honey and water, which, being closely covered, is plunged into hot ashes for two or three weeks. The essential thing is to keep the liquid from boiling, but at a high temperature. After a sufficient interval, the stones are taken out, cleansed, passed through a bath of sulphuric acid, and then they undergo a second course of roasting in the hot ashes.

To produce a color in the stones, it is necessary they should be penetrated by some carbonisable substance. This is effected by the honey, which, under the influence of long-continued heat, finds its way into the interior of the crystal, where its carbonisation, if not complete in the first instance, is finished by the sulphuric acid. Some lapidaries use olive oil instead of honey. The shade of color depends on the porosity of the layers of the stone; the most porous become at times perfectly black. Some are colored in two or three hours, others in as many days, others in a week or two, and some resist all attempts to change their natural hue. Some, when taken out of the oven, are found to be a rich dark brown, or chocolate; others, again, having been penetrated by the coloring matter

between the layers, are striped alternately white, gray, and brown, like the onyx and sardonyx. By soaking the stones in a solution of sulphate of iron, and then placing them for a few hours in the oven, a fine cornelian red is produced in the porous layers, while those not porous remain unaltered. Thus it not unfrequently happens that very coarse and common stones—muddy-yellow, or cloudy-gray, which in their natural condition would be valueless, are passed off as stones of the first quality. It is only within the last forty years that this process has been known in Germany, but the Italian lapidaries were acquainted with it centuries ago. Hence we can account for the exquisite color of antique cameos and other ornaments once numerous in the cabinets of Italy, and now to be seen in museums and private collections in all parts of the world. The dealers, when making their purchases of what we may call the raw material, select what appears to be a desirable piece, and chipping off a minute portion, they moisten the exposed surface with the tongue, and watch the absorption of the moisture. If regular and equal, the stone is good for an onyx; if not, it is added to the heap of inferior varieties. This, however, is but a rough and ready test, and not always decisive.

The pores of the stones by which the color is conveyed and retained, are visible with the microscope, and the effect of various tints is produced according as the light falls upon them at different angles. The rainbow-agate is full of minute cells, which, when exposed to the sun, produce prismatic colors, as is observed in the strise of mother-of-pearl. To detect cavities in the stones, they are soaked in water, which, slowly penetrating, reveals the hollows. Some already contain water when first found; and it is a remarkable fact, that, if kept in a dry place, the water disappears, but without leaving the slightest trace of moisture on the surface, and the stones can only be refilled by boiling them.

Balls of striped red chalcedony are much prized; a large one, weighing a hundred pounds, was found in 1844 near Weisselberg, and was sold in the rough for 700 guilders. Some kinds of chalcedony are made to appear of a citron yellow, by a two days' roasting in an oven, and a subsequent immersion in a close hot bath of spirit of salt for two or three weeks. A blue color, which has all the effect of a turquoise, is also produced; but the particular coloring process has hitherto been kept a secret. Those stones which are naturally colored are at times roasted, to heighten the tint, and add to its permanency. The Brazilian cornelian becomes singularly lustrous under the process; the explanation being that the long-continued action of heat removes the oxyhydrate of iron contained in the stone, leaving it with a clear brightness diffused through the whole mass. The smallest stones are roasted before polishing; but the large ones, of which saucers, vases, cups, plates, &c., are made, are first cut into the required shape and thickness—otherwise, they fly to pieces when exposed to heat. After all the coloring operations have been gone through, the stones are ground on a wheel; soaked in oil for a day, to conceal the fine scratches, and give a good polish, and then cleaned off with bran.

Those who examined the collection of gems and works of Art from rare stones in the great Exhibition of 1851, will remember the elegant onyx vases of different colors—some streaked with white natural veins, the cups of red chalcedony, a chain of the same substance in large square links of different colors, and without visible joints; besides other objects so beautifully finished, that a prize medal was awarded to the manufacturers.

So far, we have been treating of methods by which art assists nature; we come now to the gems that are not found in the side of a quarry,

but formed in the chemist's laboratory. Before the days of Berlin wool and crochet work, young ladies used to amuse themselves by making crystalline baskets and trays, as ornaments for the mantel-piece, but they had first to dissolve their alum. The chemist works by other means; and especially since the application of electro-galvanism to his processes, there is something really wonderful in the results. He produces crystals at pleasure, and in lumps that would astonish those who once labored so hard in search of the philosopher's stone. A few years ago, M. Ebelman laid before the French Academy of Sciences specimens of artificial quartz—some white, others blue, red, and violet; and by mixing chlorure of gold with the silicic acid used in the composition, he produced a mass traversed throughout with delicate veins of gold, similar to the lumps brought from Australia or California. By a modification of his process, he produced hydrophane, that species of opal which is transparent only when immersed in water; and specimens also of the allied crystal, hyalite. In this operation, silicic ether and moist air are principally employed; and a variety of colors could be imparted by the admixture of different colored alcoholic solutions. Chloride of gold produces a beautiful topaz yellow; and by exposing the crystal for a time to light, the gold is dispersed through it in flakes, as in aventurin; and kept in sunlight, the flakes change to a violet or rose color, and become transparent. In this fact we have an extraordinary instance of molecular action—the distribution of metallic scales through a solid mass; one which, as some geologists suppose, helps to throw light on the mode of formation of rocks and minerals. That pieces of wood, plants, and animal substances, will become silicified, or, as is commonly said, petrified, is well known; and though often wondered at, the diffusion of the gold flakes through the crystal is yet more marvellous.

Besides Ebelman, two other savans—Senarmont and Bequerel—have obtained surprising results in the artificial formation of crystals and minerals. Some among their specimens of chrysolith and chrysoberyl were hard enough to cut glass. And many curious effects have been noted in the course of their investigations and experiments. Glass containing arsenic, though at first transparent, becomes cloudy and opaque, then waxy, and finally crystalline. A familiar instance of a similar effect is offered by barley-sugar, which gradually loses its transparency, and becomes somewhat waxy in texture. Another discovery was, that pounded loaf-sugar, mixed with sulphuric acid, forms a glutinous substance which, when dry, detonates like gun-cotton.

We might go on with these interesting results, which open novel views of the capabilities of chemical science; but for the present we content ourselves with a few words on ultramarine—a substance much used by artists, and by a certain class of artificers. Some years ago, it was prepared exclusively from *lapis lazuli*, a mineral found in Siberia, and was sold at prices varying from seven to twenty guineas the ounce, according to quality. But the chemists set to work upon it, prying, weighing, testing, and eventually discovered its constituents, but were long at a loss for the coloring principle. At last Guimet, of Lyons, hit on the idea of trying to combine the constituents in their natural proportions, as in the native mineral; and the result was that the color was produced, and ultramarine could be sold at two guineas a pound. The constituents are—silicate of alumina, soda, and sulphuret of sodium; and the color is supposed to be due to the action of the last on the two first. Guimet's success set other experimenters on the scent; the secret was recently discovered, and now ultramarine may be bought at 1s. 3d. a pound, and is largely used in many industrial processes.